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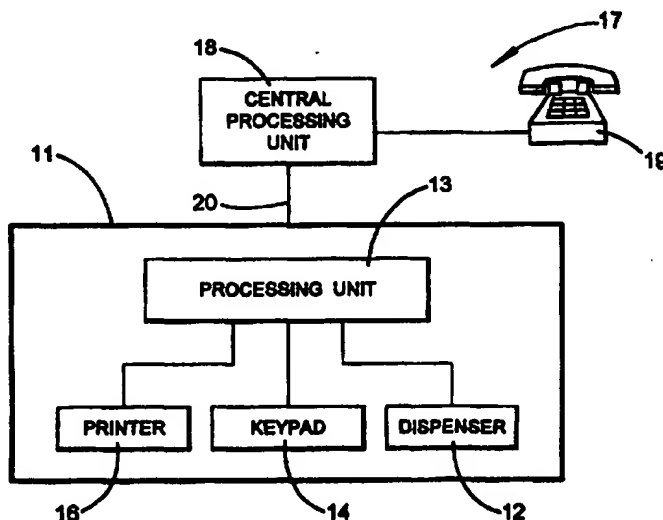
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(54) Title: A SYSTEM FOR DISPENSING MEDICINAL PRODUCTS**(57) Abstract**

A system (17) for retail dispensing of medicinal products comprises a dispensing unit (11), including a dispenser (12), a processing unit (13), a keypad (14) and a printer (16), and a central processing unit (18) under control of a dispensing chemist. A medical practitioner communicates to the CPU (18), for example by means of a digital telephone (19), details of a prescribed medicinal product and obtains an access code and informs a patient of the code. The access code, an address code and a pay code are transmitted by a communication link (20) from the CPU (18) to the processing unit (13). When the patient enters the access code by way of the keypad (14) the appropriate medicinal product is dispensed by the dispenser (12), details personal to the patient having been printed thereon by the printer (16).

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A System for Dispensing Medicinal Products

This invention relates to a system for dispensing medicinal products.

It is common for doctors in General Practice to be contacted outside of surgery hours by patients who are unwell. Generally, pharmacies are not open for business at these times and it is common for doctors to visit patients simply to deliver medication.

It is desirable, therefore, to provide a system for dispensing medicinal products where a patient could visit a dispensing machine and obtain such a product.

A further undesirable aspect of existing methods of dispensing medicinal products is lack of awareness. Often persons who hand over a prescription to a pharmacist in exchange for medicinal products are not universally reliable in conveying information as to previous and current use of medicines or in understanding and remembering information as to use of medicines which are dispensed.

Therefore, it is furthermore desirable that the safety of use of medicines be enhanced by providing a pharmacist with instant access to an electronic record of medicines previously dispensed to a patient.

In US-A-5084828 there is disclosed an interactive medication delivery system intended for institutional use, the system comprising a dispenser including a store for storing medicinal products, a processing unit for controlling operation of the dispenser, means operable by a user of the dispenser for entering identifying signals in the processing unit and a remote command unit adapted to communicate with the processing unit by a communications link whereby the signals are supplied to the processing unit from the command unit.

Although the system may be suitable for institutional use, where health parameters of a patient are under surveillance and where administration of medication on demand but from within the institution may be controlled by the patient or by a central facility as specified in lines 26 to 28 of column 9 of US-A-5084828, the system is not suitable for retailing medicinal products to the public because there is insufficient control of the dispensing process.

The invention is characterised in that the command unit is adapted to generate signals in a code such that, when signals in the same code are entered by the user, a response signal is transmitted from the processing unit to effect release of a selected product from the store.

Therefore, the invention provides a system for effectively controlling dispensing of medicinal products so that only an intended user is in a position to receive medication from the system.

Following is a description, by way of example only and with reference to the accompanying drawings, of one method of carrying the invention into effect.

In the drawings:-

Figure 1 is a flow diagram of one embodiment of a system in accordance with the present invention, and

Figure 2 is a flow diagram of another embodiment of a system in accordance with the present invention.

Referring now to Figure 1 of the drawings, there is shown a system 10 intended for retail distribution of prescription medicines. The system 10 comprises a dispensing unit 11 including a dispenser 12, a processing unit 13 and a keypad 14 for entering data into the processing unit 13. The dispensing unit 11 includes a display (not shown) and a plurality of stores (not shown) each for storing a plurality of medicinal products and each store having a product release mechanism controlled by the processing unit 13 for sequentially releasing from the store into a collection receptacle (not shown) successive products located in the

store. The medicinal products may comprise tablets located in rectangular packets or bottles of liquid medication also in rectangular boxes. The dispensing unit 11 also includes means (not shown) for receiving cash and/or a transaction card and a receptacle (not shown) for receiving dispensed medicinal products.

The processing unit 13 includes means (not shown) for evaluating cash and/or credit details from a transaction card inserted in the dispensing unit 11. The processing unit 13 is adapted to send and receive signals in a telecommunications network. The processing unit 13 includes a data store (not shown) for storing doctor codes unique to doctors who subscribe to the system and the processing unit 13 is adapted to respond to random access codes provided to patients and to the processing unit 13 by doctors who subscribe to the system.

When a patient contacts a doctor and it is agreed that the patient would be advised to visit the dispensing unit 11 and obtain medication, the doctor informs the patient of the location of the dispensing unit 11, the medicine the doctor is prescribing and the requirement, if any, for payment. The doctor also agrees with the patient an access code to use in order to obtain access to the dispensing unit 11 for that supply of medicine.

The doctor then establishes communication with the processing unit 13 by keying in a unique doctor code via a telephone keypad 15.

When this is achieved the doctor keys in the following:-

- Access code - to prime the processing unit 13 to respond to the patient when the patient visits the dispensing unit 11 and enters that access code via the keypad 14.
- Pay code - indicating whether the patient is of a category entitled to free medication; whether the patient should be charged the standard prescription charge; or whether the patient should be charged a standard rate for prescriptions.
- Address code - identifying in which store the prescribed medicinal product is located.

The processing unit 13 informs the doctor of the identity of the medicine in the store the doctor has specified in order that the doctor can verify that this is the one required, or change it if necessary. The doctor may also use the keypad 15 to enter details as to the patient's name and directions as how the medication should be taken by the patient. The patient then visits the dispensing unit 11 and enters the access code by way of the keypad 14. On receipt of the

access code, the processing unit 13 is primed to an "active" condition.

If the pay code indicates that the patient is not entitled to receive free medication, the cost of the medication will be displayed on the display of the dispensing unit 11 and the patient will then be required to insert cash or a transaction card. Assuming that the processing unit 13 verifies that the transaction may proceed, a release mechanism in the appropriate store containing the medicinal products corresponding to the "address code" is activated so that one such product will be dispensed by the dispenser 12 and released into the receptacle and removed by the patient.

The system 10 may include a printer 16 controlled by the processing unit 13 and adapted to print on the medicinal products details as to the name of the patient and directions for use of the medication.

The dispensing unit 11 may also include a device (not shown) for providing a printed or electronic record of transactions completed and medicinal products dispensed by the dispensing unit 11, such details being convenient for restocking the dispensing unit by the pharmacist or applying for reimbursement.

Referring now to Figure 2 of the drawings, there is shown a system 17 for retail distribution of prescription medicines,

medicines requiring pharmacist supervision and medicines that are available over the counter. The system 17 is similar to the system 10 except that the system 17 includes a central processing unit 18.

Unlike in the system 10, operation of the system 17 is effected under control of the central processing unit 18 whereby a doctor establishes communication with the central processing unit 18 by means of a digital telephone 19. The doctor generates patients' access codes in accordance with a previous arrangement with the proprietor of the central processing unit 18. The doctor communicates the access codes to the patients as appropriate. The central processing unit 18 is in communication with the processing unit 13 by means of a communications link 20 and the access code is transmitted from the central processing unit 18 to the processing unit 13 by means of the communications link 20.

The central processing unit 18 may be operated by a pharmacist who, in effect, would be in control of dispensing medicinal products from the system 17. The arrangement would enable a qualified pharmacist to take responsibility for dispensing the medicinal products.

It will be appreciated that a plurality of dispensing units 11 may be interconnected one with another under the control of the central processing unit 18 for the purpose of stock

control, advising the users if any dispensing unit 11 is out of stock of a requisite medicine, suggesting possible alternatives that are in stock and/or indicating as to the location of other such dispensing units 11 where there is supply of the medicine.

It will also be appreciated that the or each dispensing unit 11 may include a light which is operational when the dispensing unit 11 is approached; a sensor and camera which records a series of wide angle photographs if the dispensing unit 11 is used violently; and a facility for sounding an alarm if the dispensing unit 11 is used violently.

The transaction card referred to above may be a so-called "smart" card which would be provided with information relating to the user of the card and the or each dispensing unit 11 included within a system 17 may be adapted to interact with such a card when the card is entered therein to permit the identity of the user to be verified when the user's identity card is also inserted in the dispensing unit 11; to permit the pharmacist to check for drug interactions and safeguard against over-prescribing from data available on the smart card and to make available to doctors and pharmacists information regarding previous medicines dispensed to patients who are unable to name them because of lack of retentiveness or because of a medical condition or because they are located at a distance from where their medicines are stored. The combination of the central

processing unit 18 operated by a pharmacist and use of a smart card will allow the pharmacist to verify that the card has not been reported as lost or stolen.

Furthermore, it will be appreciated that the or each dispensing unit 11 may be provided with a scanner for scanning prescriptions inserted therein. The scanner would generate signals indicative of information on the prescription and the signals would be transmitted to the central processing unit 18 where the information can be verified by the pharmacist. The signals may also be used for updating records for stock control purposes.

It will also be appreciated that the or each dispensing unit 11 may be adapted to interact with smart cards so as to enable patients to obtain over-the-counter medicines out-of-hours without consulting a doctor or pharmacist. In such an arrangement, information in the form of a menu would be available on a screen of the dispensing unit 11 and a patient would be invited to select from lists of symptoms, provoking factors and relieving factors and the patient then would be invited to list what medications the patient may have taken in the recent past and what other chronic conditions the patient suffers from. The dispensing unit 11 could then either supply an over-the-counter medication or information would be present on the screen indicating that the patient should consult a doctor before taking further medication. The information relating to these transactions

would be entered on the patient's smart card prior to withdrawal of the card from the dispensing unit 11 and the information would also be entered in the central processing unit 18 for later medical use.

The printer 16 may also be adapted to provide advisory documents in a range of languages such documents relating to management of health problems as specified by a doctor for a patient. The advisory documents may be retained on a computer database of a dispensing unit 11 and the information may be modified by a doctor having regard to information retrieved from a patient's smart card or to information supplied personally.

The central processing unit 18 may include a database of international brand names of pharmaceutical preparations for association with medicinal products stored in each dispensing unit 11. With such an arrangement, it should be possible for a doctor or pharmacist in one country to specify a preparation to be dispensed to a patient in another country and such would be an advantage to a visitor abroad who would prefer to consult a doctor or health service from his or her native land.

The dispensing unit 11 may be adopted for dispensing bulky healthcare devices, such as oxygen cylinders.

A video conferencing facility may be provided between the or each dispensing unit 11 and the central processing unit 18 and a doctor.

The or each dispensing unit 11 may be provided with a dedicated telephone so that patients may contact the controlling pharmacist and discuss any queries about use of the medication.

With a system for dispensing medicinal products in accordance with the present invention the safety of use of medicines is enhanced by a pharmacist having instant access to an electronic record of medicines previously dispensed to a patient. A explanatory service may be provided by the provision of one of a selection of pre-recorded messages directed through a telephone earpiece to a purchaser of the medicine.

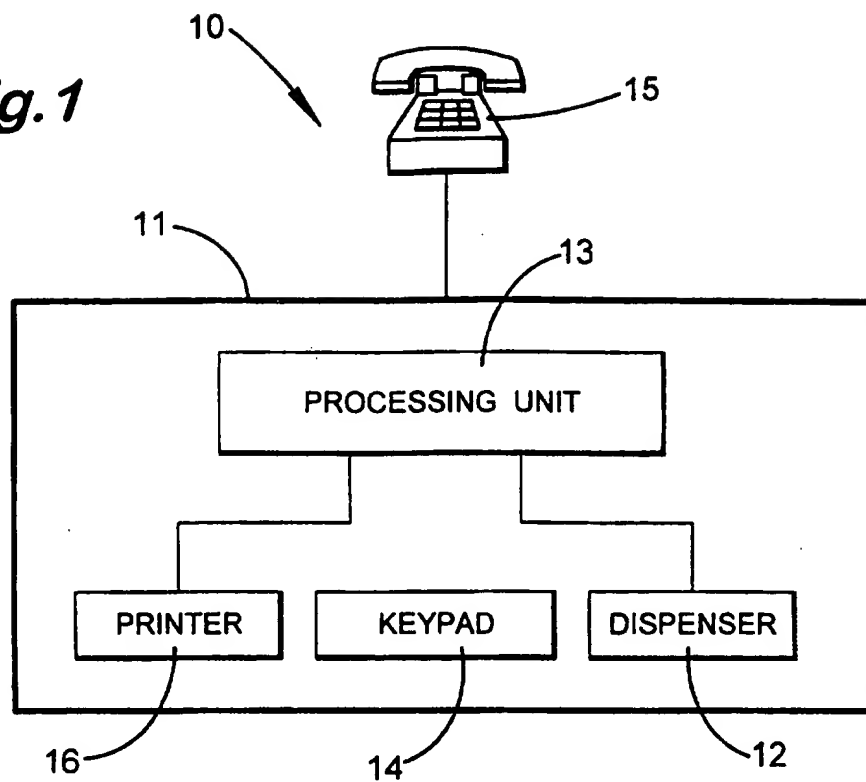
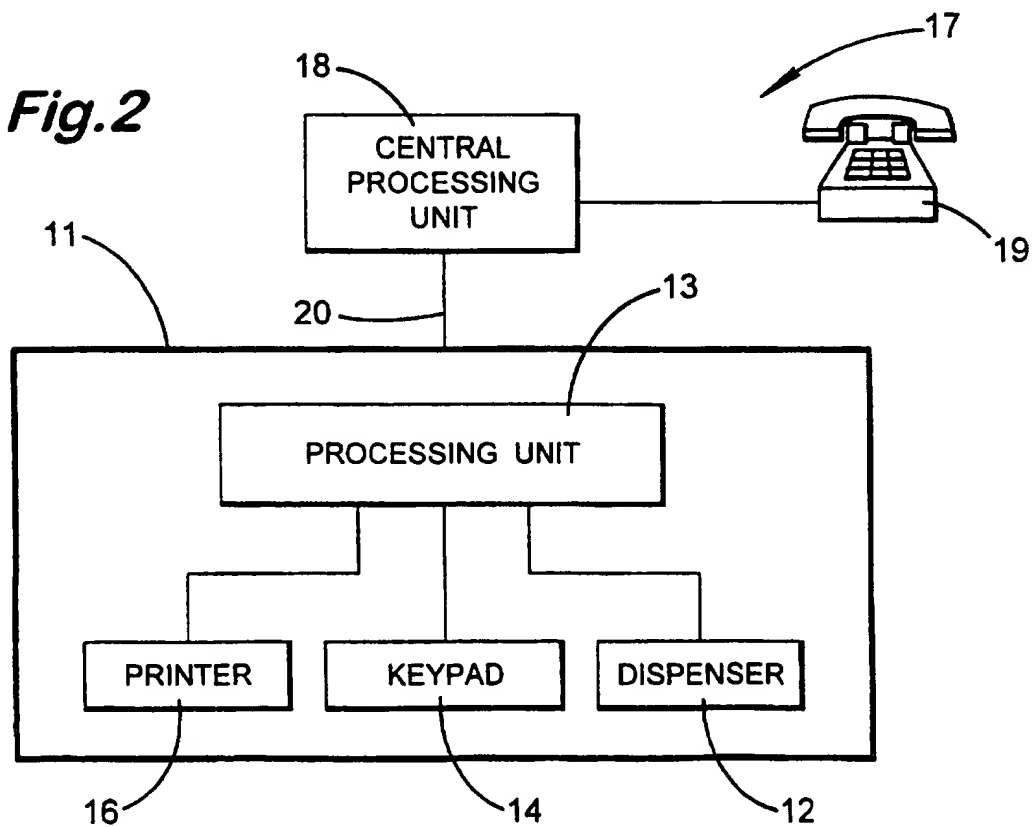
Use of electronic communication devices removes the need for a pharmacist to be physically present at the time that a prescription is dispensed. A system in accordance with the present invention this facilitates provision of pharmacy services economically to sparsely populated areas.

Claims

1. A system (10,17) for dispensing medicinal products comprising a dispensing unit (11) including a store for storing the products, a processor (13) for controlling operation of the dispensing unit (11), means (14) operable by a user of the dispensing unit (11) for entering identifying signals into the processor (13) and a remote command unit (15,18) adapted to communicate with the processor (13) by a communications link whereby the signals are supplied to the processor (13) from the command unit (15,18), characterised in that the command unit (15,18) is adapted to generate signals in a code such that, when signals in the same code are entered by the user, a response signal is transmitted from the processor (13) to effect release of a selected product from the store.
2. A system (10,17) as claimed in Claim 1 characterised in that the dispensing unit (11) includes a means for evaluating a credit entered in the system by the user and for controlling release of the selected medicine when the value of the credit is not less than a predetermined value.

3. A system (10,17) as claimed in Claim 1 or Claim 2 characterised in that the dispensing unit (11) includes a printer (16).
4. A system (10,17) as claimed in any one of the preceding Claims characterised in that the command unit (15,18) includes a printer.
5. A system (17) as claimed in any one of the preceding Claims characterised in that the dispensing unit (11) includes a scanner.
6. A system (17) as claimed in any one of the preceding Claims characterised in that there is provided a plurality of dispensing units (11) each connected to the command unit (18) by a corresponding one of a plurality of communications links in a network.

1/1

Fig. 1**Fig. 2**

INTERNATIONAL SEARCH REPORT

Int onal Application No
PCT/GB 97/00411

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61J7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61J A61G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WD 95 25423 A (CONSUMER HEALTH ENTREPRENEURS B.V.) 28 September 1995 see the whole document	1-3,6
A	US 3 917 045 A (WILLIAMS) 4 November 1975 see column 2, line 27 - column 3, line 59 see column 5, line 20 - column 6, line 32 see column 12, line 11 - column 13, line 68; figures 1,2	1
A	US 4 847 764 A (HALVORSON) 11 July 1989 see column 2, line 65 - column 6, line 2; figure 1	4
A	US 5 084 828 A (KAUFMAN) 28 January 1992 cited in the application see the whole document	1

☐ Further documents are listed in the continuation of box C.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 97/00411

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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